

CE 572 – Spring 2015

Class 36

20 April 2015

14	<p>Class 36 (4.20) HCM Applications Guide HCMAG overview Assigned:</p> <ul style="list-style-type: none"> • Assignment 43 (HCMAG) • Assignment 44 (Project) 	<p>Class 37 (4.22) HCM Applications Guide HCMAG discussion Exam #2 review</p>	<p>Class 38 (4.24) HCM Applications Guide HCMAG presentations</p>
15	<p>Class 39 (4.27) HCM Applications Guide Project proposal due (A44, Task 1) Peer review of proposal</p>	<p>Class 40 (4.29) HCM Applications Guide Project discussion and review</p>	<p>Class 41 (5.01) HCM Applications Guide No class meeting (Expo!)</p>
16	<p>Class 42 (5.04) HCM Applications Guide <u>HCS results (A44, Task 2)</u></p>	<p>Class 43 (5.06) HCM Applications Guide Project discussion and review</p>	<p>Class 44 (5.08) HCM Applications Guide Draft review due (<u>A44, Task 3</u>)</p>
17	<p>Final exam period (Tuesday, 5.12, 10 am-12 noon) Final report due Project presentations</p>		

Operational Analysis?

OPERATIONAL ANALYSIS

Operational analyses are applications of the HCM that are generally oriented toward current or near-term conditions. They aim at providing information for decisions on whether there is a need for improvements to an existing point, segment, or facility. Occasionally, an analysis is made to determine whether a more extensive planning study is needed. Sometimes the focus is on a network, or part of one, that is approaching oversaturation or an undesirable LOS: When, in the near term, is the facility likely to fail (or fail to meet a desired LOS threshold)? To answer this question, an estimate of the service flow rate allowable under a specified LOS is required.

HCM analyses also help practitioners make decisions about operating conditions. Typical alternatives often involve the analysis of appropriate lane configurations, alternative traffic control devices, signal timing and phasing, spacing and location of bus stops, frequency of bus service, and addition of a managed (e.g., high-occupancy vehicle) lane or a bicycle lane. The analysis produces operational measures for a comparison of the alternatives.

Because of the immediate, short-term focus of operational analyses, it is possible to provide detailed inputs to the models. Many of the inputs may be based on field measurements of traffic, physical features, and control parameters. Generally, it is inappropriate to use default values at this level of analysis.

Operational Analysis

In an operational analysis, an analyst applies an HCM methodology directly and supplies all of the required input parameters from measured or forecast values. No, or minimal, default values are used. Of the available ways to apply HCM methodologies, operational analyses provide the highest level of accuracy but, as a result, also require the most detailed data collection, which has time and cost implications.

An operational analysis helps in making decisions about operating conditions. Typical alternatives consider, for example, changes in traffic signal timing and phasing, changes in lane configurations, spacing and location of bus stops, the frequency of bus service, or the addition of a bicycle lane. The analysis produces operational measures that can be used to compare the alternatives.

Krome Avenue is a 33-mile north-south route that bypasses Miami, Florida on the west side. It is essentially a rural route that has very little roadside development. Florida's Turnpike is about 5 miles to the east, providing several east-west connections to Krome Avenue. Its two-lane configuration has limited capacity compared to other facilities such as freeways and multilane roadways. Most of the route now operates well within its capacity, except that some congestion has been observed at critical locations. This is a region of high population growth that is expected to generate continually increasing traffic volumes. Prompted primarily by safety considerations, the posted speeds have already been reduced below the 55 mph level typically found on open highways.

Krome Avenue (SR 997) is one of the westernmost roadways in the Miami urban area, separating the developed portion of Miami from the Everglades, as shown in the map of Exhibit 3-1. There are no access controls that would give it any of the characteristics of a freeway. Traffic volumes are moderate; and congestion is not a major problem, except at a few critical intersections with important east-west arterials.

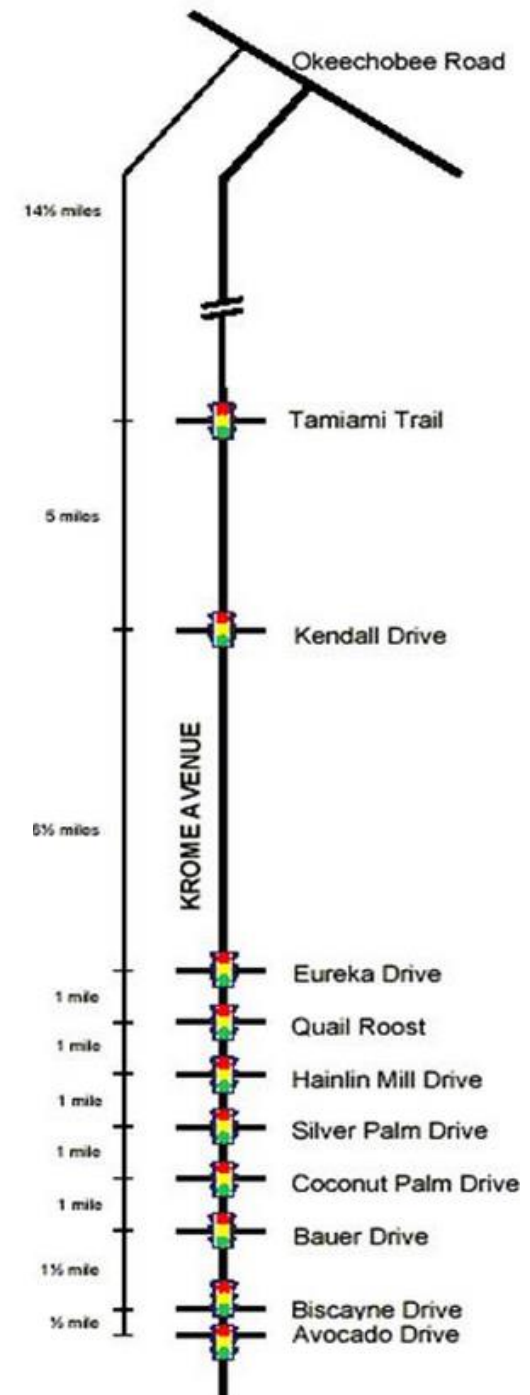
Discussion:



Consider the situation described above and review the sketches and location map showing the street system. What steps would you need to go through to conduct a useful and relevant study of the Krome Avenue route identified in [Exhibit 3-1](#)?

To begin this particular case study, we first need to consider issues related to setting the scope, the goals and objectives, the analysis methodology, the sequencing of the analysis, the tools to use, and the data to employ. The following series of questions must be answered before the detailed work begins:

- What are the goals, objectives, and scope?
- What tools should we apply?
- What analyses should be conducted?
- Who are the stakeholders and what are their issues?
- What information is required to support the analyses?
- What growth rates should be expected for future traffic volumes?





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The *Highway Capacity Manual Applications Guidebook* (HCMAG) is intended to assist transportation professionals with the appropriate use and interpretation of the analysis methodologies contained in the Highway Capacity Manual. It uses actual case studies as a means of educating practitioners on how to properly apply these methodologies and when to use alternative means of analysis and evaluation. Each case study begins with a description of one or more interconnected transportation facilities located somewhere in the United States. As part of this description, a number of performance-related issues and problems are identified that require resolution, and these are translated into a series of problem statements subsequently addressed in sequential order. The problem discussions provide detailed information on such issues as data requirements, selection of an appropriate analysis procedure, evaluation and interpretation of the analysis results, and next steps.

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CASE STUDIES

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 [Case Study #1: U.S. 95 Corridor](#)

 [Case Study #2: Route 146 Corridor](#)

 [Case Study #3: Krome Avenue](#)

 [Case Study #4: Alternate Route 7](#)

 [Case Study #5: Museum Road](#)

 [Case Study #6: I-465 Corridor, Indianapolis](#)

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This Guidebook is intended to be a supplemental resource document to the HCM that can be used in a variety of ways:

- It can provide guidance on how to approach, execute, and interpret the results of a facility-specific analysis that the user might need to undertake.
- It can offer insights into specific areas of the analysis where special care should be taken to ensure that the analysis results reasonably and appropriately address the issues of concern.
- It can identify and characterize the interactions that one facility type can have on other adjacent or nearby facility types.
- It can provide example data sets and prototypical analysis procedures that can be used as templates for addressing other similar real-world problems that the user might encounter.

Introduction

Format of Each Case Study



[Printable Version](#)

Each case study is organized similarly:

- Introductory materials;
- Problems (and subproblems); and
- Analysis and discussion.

The introductory sections are designed to acquaint the reader with the important characteristics of the case study, including the transportation facilities of interest, the relevant traffic characteristics, the surrounding land uses, the key stakeholders and their issues of concern, and the general scope of the investigation that is about to be undertaken. These sections also provide an overview of the analyses that will be undertaken later in the chapter. Based on this, they also discuss the range of possible analysis tools and their associated data requirements. This discussion leads to the identification of the particular analysis tools that will be applied to the subsequent problems in the chapter.

Introduction

Format of Each Case Study



[Printable Version](#)

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Each problem is separately discussed, and in many cases more than one analysis must be conducted to address all the issues the problem raises. Thus, each problem is typically associated with several sub-problems, each of which constitutes the application of a single analysis procedure. Within each sub-problem, the information necessary to conduct the analysis is presented, along with the analysis results. The step-wise application of the analysis procedure is conducted through use of appropriate software and is not explicitly discussed in the HCMAG. This avoids repetition of information already available and published in the HCM and/or software reference manuals.

Introduction

Format of Each Case Study



[Printable Version](#)

Each case study is organized similarly:

- Introductory materials;
- Problems (and subproblems); and
- Analysis and discussion.

The analysis and discussion sections of each case study expand upon the findings of each analysis and problem to identify the key insights that have emerged and the important conclusions that can be reached. Within this section, the HCMAG critically reviews the results to ensure that they are reasonable, meaningful, and consistent. It may also deal with issues of sensitivity analysis, the feasibility of the recommended solutions, methods for presenting results to decision makers, and possible next steps.

Assignment 43 - HCMAG Presentations

The purpose of this assignment is to review one case study from the [HCM Applications Guide](#) and make a presentation on your findings. The content of the HCMAG will serve as an example for the final project (Assignment 44) that you will complete by the end of the semester. For this current assignment:

1. Read the HCMAG Research Results Digest from the Resources page.
2. Read the Introduction chapter from the HCMAG.
3. Read the case study from the HCMAG that you have been assigned.
4. Identify the primary problem that the case study is intended to address. Identify the scope of the analysis, the goals of the evaluation or analysis, and the specific problems that are used to address or illustrate the original problem.
5. Through discussions with your partner, prepare a list of things that you learned about traffic analysis as a result of reading this case study.
6. Based on items 2 and 3, prepare a presentation (10-15 minutes duration) that you will make to the rest of the class (with a partner) on Friday, April 24th. The presentation should show your understanding of the case study and what it is intended to accomplish. It should also include what you have learned about conducting an operational analysis of an intersection.

The case study assignments are as follows:

- Case study 1. US 95 corridor (Arman, Ben)
- Case study 2. Route 146 corridor (Brett, Marvin, Maged)
- Case study 5. Museum Road (Riannon, Kushel)

Assignment 44 - Project

The purpose of this assignment is to give you the experience of completing an analysis of traffic operations using the methods of the HCM, the HCS software tool, and the insights and methods from the HCM Applications Guide. Your work will include a statement of the problem, the scope of the problem including the key intersection and the larger system of which it is a part, a list of the technical issues that could be addressed by one or more HCM methods or models, a discussion of each of these issues, and the results that are produced with the application of the particular HCM method. This work will culminate with a final report and presentation during the final examination period on Tuesday, May 12th. You will be assigned a vacant parcel of land within the city of Moscow as the basis for your project.

Task 1. Review the parcel of land that you have been assigned using online maps and by visiting the site. Prepare a study proposal that describes the site that you have been assigned and a traffic problem that you create that you will address in your final report. The proposal should also include the scope of the problem that you will address (including your initial perception of the key issues that are involved) and the relevant HCM models or methods that you will use. It should include the list of works tasks that you will address and complete. It should also include three issues that you will address as per the approach taken by the HCMAG. What you learn from reading the HCMAG should also be used to inform and structure your proposal. The proposal should be either two or three pages in length. You may work with me as you create this problem. This proposal should be emailed to me by Monday, April 27th at 800 am. Bring two printed copies of your proposal to class on April 27th.

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Task 2. Complete all HCS work and summarize these results in a set of Excel tables. Be prepared to share your work with the class using no more than 5 PowerPoint slides in class on Monday, May 4th. Your Excel worksheet and PowerPoint slides should be emailed to me by 800 am on May 4th.

Task 3. Complete your draft report by Friday, May 8th. Be prepared to discuss your draft with me during class and identify any remaining issues to complete. The draft report should be emailed to me by 800 am on May 8th.

Task 4. Complete the final report and presentation by Tuesday, May 12th. You will make a 15 minute presentation of your work during the final examination period. The final report should be no more than 10 pages in length. The deliverables will be the final report (Word document) and presentation (including PowerPoint slides) and must be emailed to me in a zip folder by Tuesday, May 12th at 800 am.

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Your report and presentation will be graded based on the following factors:

- Description of the problem that you created. (5 points)
- Your approach to the analysis of traffic operations as described in the report. (5 points)
- How well you included insights from the HCM Applications Guide in approaching the analysis of traffic operations. (10 points)
- The correct and insightful use of the HCM and HCS. (10 points)
- Your interpretation of the HCS results in addressing your problem. (10 points)
- The quality of your report including organization and writing. (15 points)
- The quality of your presentation. (15 points)

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Assigned case study locations:

1. Parcel: NE Corner of Rosauers Parking Lot. Primary intersection: US 95/D Street. (Arman)
2. Parcel: Empty land near US 95 and Rodeo Dr. Primary intersection: US 95/Rodeo Dr (Maged)
3. Parcel: Vacant lot at Jackson and 3rd. Primary intersection: Jackson/3rd (Kushal)
4. Parcel: Parcel near Farm Rd and A Street. Primary intersection: SH 8/Farm Rd. (Marvin)
5. Parcel: Undeveloped land at SH 8 east of Mt. View. Primary intersection: SH 8/Mt View. (Brett)
6. Parcel: Parcel near US 95 and Sweet, including Dominos Pizza. Primary intersection: US 95/Sweet. (Ben)
7. Parcel: Vacant land near 8th St (College St) and Jackson St. Primary intersection: Jackson/College. (Riannon)

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Common Questions:

Where do we get the traffic volumes?

- You will create any data that you need for both existing and future conditions.

How do we know the size and type of the proposed developed?

- You will create the scenario that describes the development and its characteristics that you believe to be appropriate to the study location that you have been assigned.

Do we need to consider any geometric design issues in our work?

- Mostly no. Your focus should be on the existing geometric layout of the site. However, if the site does not currently include driveway access from a street, you will need to identify where this access point is. Again, you do not need to do any geometric design for this project.



Parcel: NE corner of Rosauers parking lot
Primary intersection: US 95/D Street



Parcel: Empty land near US 95 and Rodeo Dr
Primary intersection: US 95/Rodeo Dr



Parcel: Vacant lot at Jackson and 3rd
Primary intersection: Jackson/3rd



Parcel: Parcel near Farm Rd and A Street
Primary intersection: SH 8/Farm Rd



Parcel: Undeveloped land at SH 8 east of Mt. View
Primary intersection: SH 8/Mt View



Parcel: Parcel near US 95 and Sweet, including Dominos Pizza
Primary intersection: US 95/Sweet



Parcel: Vacant land near 8th St (College St) and Jackson St
Primary intersection: Jackson/College

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